X10746

THYRISTOR CONTROLLER | SINGLE PHASE | PHASE TO PHASE

DMPR1 Series

12kW, 20kW, 22kW, 30kW / 230v, 415v
Dual Mode Power Controller

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KEY FEATURES:

- ✓ **Dual Mode Control:** Phase angle, burst firing, or a combination
- ✓ **Frequency Tracking:** 4-400Hz for unstable supply conditions
- ✓ Integrated High-Speed Fuse for enhanced protection
- ✓ **Adjustable Ramp Control:** 1 to 30 seconds for smooth start-up
- ✓ Enclosed design with status indication LEDs

APPLICATIONS:

Ideal for a wide range of industrial and commercial applications, including:

- Furnaces
- Ovens
- Dryers
- Air Curtains
- Hot Plates
- Heating and Ventilation Systems
- Inductive Loads such as Transformers

The **DMPR1 Series Dual Mode Power Controller** offers robust and versatile control for both single-phase (12kW/20kW) and two-phase (22kW/30kW) inductive/resistive loads up to 30kW at 415V AC. This advanced thyristor assembly features user-selectable control modes, including phase angle, burst firing, or a combination of both for optimised performance. With frequency tracking from 4Hz to 400Hz, it ensures reliable operation even in unstable supply conditions. Housed in a bespoke enclosure with easy access to signal and power terminals, the DMPR1 Series includes integral semiconductor fuses and heatsinks for a comprehensive power control solution.

TECHNICAL SPECIFICATIONS

Power / Current Ratings	12kW (52A): 20kW (87A) @a nominal supply of 230V rms 22kW (55A): 30kW (75A) @ a nominal supply of 400V rms	
Input Voltage	230V RMS +/- 10% 415V RMS +/- 10% Phase to Phase **Note:** 110V rms option available on request	
Supply Frequency	4 to 400Hz active tracking	
Control Input Options	0 to 5V dc up to a maximum of 24V dc or **Manual**: using 5kΩ Potentiometer **0-20mA/4-20mA (SW1 position 3 on)**	
Alarms Relay Rating	125V ac @ 2A	
LED Indicator	**Power LED (Green)** – Illuminates when the on board 5V dc supply is present **Status LED (Yellow)** - Brightness increases in phase angle mode and pulses on a one-second time base with a variable mark space (on-off) ratio determined by the control signal in burst fire mode. **Fault LED (Red)** - Continuously pulses when heatsink temperature rises to 90 ºC and is fully on if the internal high-speed fuse fails	
Over-temperature	Trip in temperature @ 90°C +/- 1°C (LED indicator 'flashes' continuous fast pulsing) Fixed level of 55°C brings on fan (when fitted) Level of 90°C shuts down power and alarm relay de-energises	
Zero Settings	Sets the minimum output level, zeros the output with signal of up to2V	
Span Setting	Sets the maximum output with input signals of up to 24V dc	
Soft Start	0-30 seconds initiated at power up. Also initiated when enable is used.	
Current Limit	Built in and user resettable (SW1 position 4 and VR1)	
Switch Options	Phase-angle, burst fire, V/I signal and current limit enabled or disabled.	
Cable Terminations	**Phase Power & Earth (unit dependent)**	10mm² (12/22kW); 16mm² (20/30kW) - Rising Clamp Terminal Blocks
	Remote Supply Auxiliary Alarm (relay)	1.5mm² Rising Clamp Terminal Block
	Control Signal	1.5mm² Rising Clamp Terminal Block
Terminal Torque Settings	4Nm (for power terminals 10mm² & 16mm²)	
Fusing	**230V:** 80ET (12kW), 100ET (20kW)	
	415V: 80ET (22kW), 100ET (30kW) Semiconductor type, lug fuses	
Working Temperature	60°C (maximum operational)	
Ingress Protection (IP) Rating	IP20 (Protection against solid bodies greater than 12mm; no protection against liquid)	
Dimensions	205mm (L) x 155mm (W) x 120mm (H); **with Fan Cowl:** 250mm (L) x 155mm (W) x 120mm (H)	
Fixing Centres	4 x 5 ø holes on centres 1400mm (W) x 140mm (L)	
Weight	**12kW:** (2.8kg) 20kW (3.5kg) **with Fan Cowl:** add 0.52kg **22kW:** (2.8kg) 30kW (3.5kg)	

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FUNCTIONS

Alarm Relay

The alarm circuit features voltage-free relay contacts rated up to 2A at 125V AC (RMS). The relay is energized upon power-up and will de-energize if the heatsink temperature exceeds 90ºC or if the internal high-speed fuse fails.

Over-Temperature Protection

The over-temperature protection system is equipped with a heatsink sensor that monitors temperature. If the heatsink temperature exceeds 55ºC, the cooling fan is activated (if fitted). If the temperature reaches 90ºC, the power to the load is disabled and will not resume until the temperature drops below 85ºC. During this period, the alarm relay is de-energized and the fault LED will flash continuously.

Control Options (See Connections)

The DMPR1 Series Dual Mode Power Controller offers versatile control options:

- **Phase-Angle Control (SW1 position 1 ON):** Enables phase-angle control mode.
- **Burst-Fire Control (SW1 position 2 ON):** Enables burst-fire control mode.
- **Combination Control (SW1 positions 1 and 2 ON):** Starts in phase-angle mode and switches to burst-fire mode once the control has ramped up to the set point.

These control modes allow for flexible and precise management of the power output, ensuring optimal performance for a wide range of applications.

INSTALLATION

Cooling Requirements

This robust stack assembly operates efficiently at temperatures up to 65°C with natural cooling and features a built-in 90°C over-temperature trip on the heatsink for added safety. The unit should be mounted vertically with heatsink fins oriented from top to bottom, ensuring sufficient surrounding air space to maximize natural convection cooling. If installed in an enclosure or cabinet, adequate ventilation or forced air cooling is necessary. The 27kW unit includes a built-in fan that activates when the heatsink temperature rises (refer to SPECIFICATIONS for details).

Load Considerations

The PR3 series power controllers are designed for 3-wire, 3-phase floating-star or closed delta configured resistive loads. These controllers are 2-leg thyristor units and are not suitable for 4-wire, 3-phase with star point to neutral configurations. For detailed information on configured loads, refer to the ‘Application Circuits’ section in our supporting datasheet APC (ref. X10322).

Unusual heating loads such as Molybdenum, Platinum, or Tungsten have a typical hot-to-cold resistance ratio of 10:1 and therefore draw larger currents when cold.

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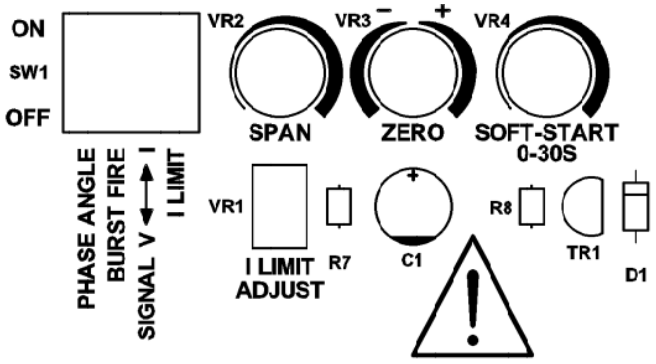
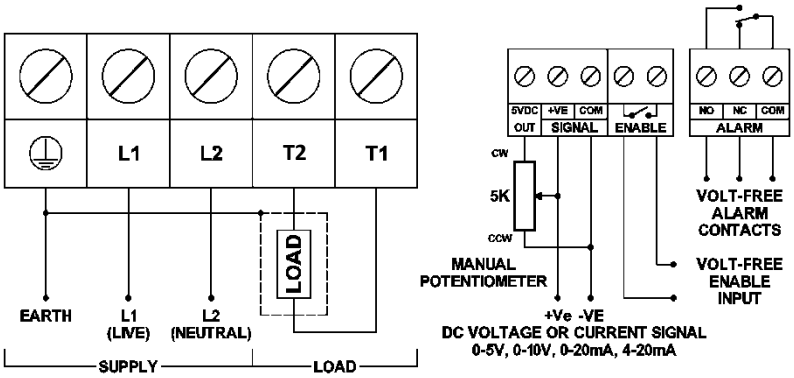
CONNECTIONS

This unit features simple clamp-type connectors for all auxiliary wiring requirements.

Note: It is factory set for an internal power supply. For details on alternative voltage *'free alarm'* supply configurations, refer to the *Functions section*. For further assistance, please contact our technical support team.





RECOMMENDATIONS

FUSING

It is recommended that semiconductor, fast-acting type fuses or circuit breakers (Semiconductor-MCB) be used for unit protection. On initial operation some loads may need an increased Factor of Safety (F of S) for unit and/or device protection. See the SRA datasheet for further information.

CE Marking

This product family carries a “CE” marking. These burst firing type controllers do not require a filter. For information see recommendation section and contact our sales desk. See the Declaration of Conformity.

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DOCUMENTS

Other documents available on request, which may be appropriate for your application:

Code	Identity	Description
X10213	ITA	Interaction: Uses for phase angle and for burst fire control
X10255	SRA	Safety Requirements: Addressing the Low Voltage Directive (LVD) including, Thermal Data/Cooling, Live Parts Warning, Earthing Requirements and Fusing Recommendations
X10322	APC	AC Power Control – Three phase application circuits
X10617		Wiring connection details are attached to the inside of the lid
P01.1	COS	UAL Conditions of Sale

It is recommended that installation and maintenance of this equipment should be done with reference to the current edition of the I.E.T. regulations (BS7671) by suitably qualified/trained personnel. The regulations contain important requirements regarding the safety of electrical equipment. For International standards refer STANDARDS on D of C.

OPTIONAL EXTRAS

Product Code	Product Description
A403001	Manual (5K) Potentiometer Knob and Leads
-	Supply voltage variation: 110V AC available on request.
*******	**High ambient Temperatures:** DMPR1-F – additional fan & cowl option for 30kW model where ambient temperatures could get above 40°C.

PRODUCT CODE AND RELATED PRODUCT CODE

Product Code	Product Description
A410291	DMPR1-E-12kW-230v-52A – Single Phase
A410292	DMPR1-E-20kW-230v-87A – Single Phase
A410293	DMPR1-E-22kW-230v-55A – Phase-Phase
A410294	DMPR1-E-30kW-415v-75A – Phase-Phase
A410295	DMPR1-F-E-30kW-415v-75A – Phase-Phase***

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